

PATENT

Atty Docket No.: 200208134-1  
App. Ser. No.: 10/632,412IN THE CLAIMS:

*Please find below a listing of all of the pending claims. The statuses of the claims are set forth in parentheses.*

1. (Currently Amended) In A system real-time-operating-system-running-on-a hardware-platform, the operating-system-for-supporting-a-plurality-of-applications, a processor-and-at-least-one-hardware-resource, the-improvement comprising: -in-combination:

a hardware platform having a processor and at least one hardware resource;

a real time operating system supporting a plurality of software applications running on the hardware platform;

[[a]] a power manager layer, ;and b} said power manager layer being arranged to receive real time input from at least one of the plurality of software applications, wherein the real time input includes the at least one of the plurality of software applications informing the power manager layer, through an application programming interface (API) call embedded in the at least one of the plurality of software applications, of a determination made by the at least one of the plurality of software applications of a change in a current status-and-operational processor or hardware resource requirement[[s]] of each-of-said the at least one of the plurality of software applications, running-on the hardware-platform;

determining a power management adjustment using the received real time input; and exchanging information with at least one of said processor and said at least one hardware resource, wherein said information includes the determined power management adjustment, to implement real time power management responsive to said-at-least-one the real time input, wherein the real time power management includes changing the power state of at least one of said processor and said at least one hardware resource in response to the change

PATENT

Atty Docket No.: 200208134-1  
App. Ser. No.: 10/632,412

in the current processor or hardware resource requirement of the at least one of the plurality of software applications.

2. (Cancelled)

3. (Currently Amended) An operating system as defined in Claim 1 [[2]] wherein said at least one API call includes the current status of an application of said plurality of applications, the current status comprising at least one of:

- a) a notification that the at least one of the plurality of software applications has been initiated; and
- b) a notification that the at least one of the plurality of software applications has ended.

4. (Currently Amended) An operating system as defined in Claim 3 wherein the operational resource requirements of said at least one of the plurality of software applications are characterized by:

- a) a utilization profile; and
- b) said utilization profile is transmitted to said power manager with a said start call.

5. (Currently Amended) An operating system as defined in Claim 3 wherein said at least one API call includes the operational resource requirements for the at least one of the

**PATENT**Atty Docket No.: 200208134-1  
App. Ser. No.: 10/632,412

plurality of software applications, the operational resource requirements including at least one of:

- a) a notification that said at least one of the plurality of software applications requires at least one hardware resource; and
- b) a notification that said at least one of the plurality of software applications no longer requires said at least one hardware resource.

6. (Currently Amended) An operating system as defined in Claim 1 further comprising:

- a) a hardware abstraction layer, wherein [();]
- b) information is exchanged between said power manager layer and said hardware abstraction layer by means of application-interface calls; and
- c) said hardware abstraction layer is arranged to cause said processor to be actuated in accordance with said calls.

7. (Currently Amended) An operating system as defined in Claim 1 further comprising:

- a) a driver layer, wherein ; and
- b) information is exchanged between said power manager layer and said driver layer by means of application-program interface calls.

8. (Original) An operating system as defined in Claim 1 wherein said power manager layer further comprises:

**PATENT**

Atty Docket No.: 200208134-1  
App. Ser. No.: 10/632,412

- a) a processor power state selection mode; and
- b) a hardware resource power state selection mode.

9. (Original) An operating system as defined in Claim 8 wherein said power manager layer includes a resource allocation table.

10. (Currently Amended) An operating system as defined in Claim 1 further comprising a driver layer arranged to:

- a) receive an application-program interface call including the operational processor or hardware resource requirement [[s]] for the at least one of the plurality of software applications, the operational processor or hardware resource requirement [[s]] containing a power state instruction concerning a resource from said power manager layer and to generate a corresponding instruction; and
- b) transmit corresponding information to a hardware abstraction layer by application-program interface call.

11. (Original) An operating system as defined in Claim 6 wherein said hardware abstraction layer is further arranged to:

- a) exchange information with a driver layer by means of program-interface calls; and
- b) cause said at least one resource to be actuated in accordance with said calls.

**PATENT**Atty Docket No.: 200208134-1  
App. Ser. No.: 10/632,412

12. (Currently Amended) A real time power management system for a processor-driven hardware platform for supporting a plurality of software applications, said platform having at least one hardware resource wherein said processor is characterized by a plurality of power states and said at least one hardware resource is characterized by a plurality of power states, said power management system comprising, in combination:

- a) an operating system for controlling said processor and said at least one hardware resource;
- b) said operating system including a power manager layer arranged to receive real time input from at least one of said plurality of software applications, wherein the real time input includes the at least one of the plurality of software applications informing the power manager layer, through an application programming interface (API) call embedded in the at least one of the plurality of software applications, of a change in a current status-and operational processor or hardware resource requirement[[s]] of each the at least one of said plurality of software applications, running on the hardware platform;  
select change at least one of a processor power state and a power state of said at least one hardware resource using said received real time input from the at least one software application, of said plurality of applications in response to the change in the current processor or hardware resource requirement of the at least one of the plurality of software applications.

13. (Cancelled)

14. (Currently Amended) An integrated power management system as defined in Claim 12 [[13]] wherein said at least one API call of said at least one of the plurality of

PATENT

Atty Docket No.: 200208134-1  
App. Ser. No.: 10/632,412

software applications additionally includes the current status of the at least one application, the current status including at least one of:

- a) a notification that said at least one of the plurality of software applications has been initiated; and
- b) a notification that said at least one of the plurality of software applications has ended.

15. (Currently Amended) An integrated power management system as defined in Claim 12 [[13]] wherein said at least one API call of said at least one of the plurality of software applications additionally includes the operational requirements of the at least one of application, the operational requirements including:

- a) a notification that said at least one of the plurality of software applications requires at least one hardware resource; and
- b) a notification that said at least one of the plurality of software applications no longer requires said at least one hardware resource.

16. (Currently Amended) A method for controlling power consumption in a hardware platform responsive to information from a plurality of software applications, said platform including a processor having a plurality of power states and at least one hardware resource characterized by a plurality of power states, said method comprising the steps of:

organizing said operating system into a kernel, a driver layer, a hardware abstraction layer, and a power manager layer;

**PATENT**Atty Docket No.: 200208134-1  
App. Ser. No.: 10/632,412

applying real time input from said at least one of the plurality of software applications to said power manager layer, wherein real time input includes the at least one of the plurality of software applications informing the power manager layer, through an application programming interface (API) call embedded in the at least one of the plurality of software applications, of a change in a current status and operational processor or hardware resource requirement[[s]] of each the at least one of the plurality of software applications, running on the hardware platform;

determining a power management policy in said power manager layer using said real time input; [[and]]

communicating said power management policy from said power manager layer to said processor or [[and]] said at least one hardware resource; and  
changing the power state of at least one of said processor and said at least one hardware resource in response to the change in the current processor or hardware resource requirement of the at least one of the plurality of software applications.

17. (Original) A method as defined in Claim 16 wherein the step of determining a power management policy additionally comprises the step of determining a processor power state.

18. (Original) A method as defined in Claim 16 wherein the step of determining a power management policy additionally comprises the step of determining a power state of said at least one hardware resource.

**PATENT****Atty Docket No.: 200208134-1**  
**App. Ser. No.: 10/632,412****19. (Cancelled)**

**20. (Original)** A method as defined in Claim 16 whercin the step of communicating said power management policy from said power manager layer to said processor and said at least one hardware resource additionally includes the steps of:

embedding application-program interfaces into said power manager layer, said driver layer and said hardware abstraction layer; and

communicating said power management policy by means of said calls.